



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,397	08/28/2003	Brian Mitchell Bass	RAL919990139US2	6767

25299 7590 10/20/2005

IBM CORPORATION
PO BOX 12195
DEPT YXSA, BLDG 002
RESEARCH TRIANGLE PARK, NC 27709

EXAMINER

LY, ANH

ART UNIT	PAPER NUMBER
----------	--------------

2162

DATE MAILED: 10/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/650,397

Applicant(s)

BASS ET AL.

Examiner

Anh Ly

Art Unit

2162

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
4a) Of the above claim(s) 1-13 and 24-45 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 14-23 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 28 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination (RCE)

1. The request filed on 08/04//2005 for a Request for Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 10/650,397 is acceptable and a RCE has been established. An action on the RCE follows.
2. Claims 1-13 and 24-45 have been cancelled.
3. Claims 14-23 are pending in this Application.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

Art Unit: 2162

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 14-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pub. No.: US 2001/0043602 A1 of Brown in view of Patent No.: US 5,857,196 issued to Angle et al. (hereinafter Angle).

With respect to claim 14, Brown teaches a pattern or key that is to be searched (searching for a longest prefix match for a key or pattern: sections 0007 and 0198);

a plurality of pattern search control blocks that each represent a branch in the search tree (fig. 3 and sections 0063 and 0066-0067); and

a plurality of leaves wherein each leaf is an address location for the result of a search (sections 0010, 0056 and 0058-0059).

Brown teaches a method for searching a longest prefix match of a key or pattern in the search tree, the key or prefix match key is the control blocks for searching pattern in the search tree and including a plurality of address location and nodes or leaves as shown in the fig. 2B. Brown does not clearly teach a computer readable medium containing a plurality of data structures for finding a match for a variable length search key a direct table that stores a first address location for a search tree and wherein said direct table is one of said plurality of data structures that is first accessed in conducting the search.

However, Angle teaches data structures storing in the memory of computer system (col. 1, lines 15-18, col. 2, lines 1-8 and col. 4, lines 36-48); a table containing the

starting address location for a search tree (fig. 3, and col. 1, lines 50-58 and col. 2, lines 8-36).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Brown with the teachings of Angle. One having ordinary skill in the art would have found it motivated to utilize the use of a table containing the starting address for a search tree as disclosed (Angle's col. 1, lines 50-58 and col. 2, lines 8-36), into the system of Brown for the purpose of reducing the amount of memory required to store the data and perform the search in a more faster and efficient manner (Angle's col. 1, lines 25-28 and col. 3, lines 42-46).

With respect to claim 15, Brown teaches a lookup definition table that manages a tree search memory (section 0058 and fig. 2B).

With respect to claim 16, Brown teaches wherein the lookup definition table comprises entries that define a physical memory that the tree resides in, a size of the key and leaf, and a type of search to be performed (sections 0007, 0058 and 0171-0172).

With respect to claim 17, Brown teaches wherein the lookup definition table is implemented in a plurality of memories (section 0202).

With respect to claim 18, Brown teaches the computer-readable medium as discussed in claim 14.

Brown teaches a method for searching a longest prefix match of a key or pattern in the search tree, the key or prefix match key is the control blocks for searching pattern in the search tree and including a plurality of address location and nodes or leaves as

Art Unit: 2162

shown in the fig. 2B. Brown does not clearly teach wherein a format for a direct table entry includes at least one of a search control block; a next pattern address that point to a next pattern search control block; a leaf control block address that points to a leaf or result; a next bit or bits to test; and a direct leaf.

However, Angle teaches a table containing the starting address location for a search tree (fig. 3, and col. 1, lines 50-58 and col. 2, lines 8-36) and next address field (col. 6, lines 63-67 and col. 7, lines 1-42).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Brown with the teachings of Angle. One having ordinary skill in the art would have found it motivated to utilize the use of a table containing the starting address for a search tree and the next address as disclosed (Angle's col. 1, lines 50-58 and col. 2, lines 8-36, col. 6, lines 63-67 and col. 7, lines 1-42), into the system of Brown for the purpose of reducing the amount of memory required to store the data and perform the search in a more faster and efficient manner (Angle's col. 1, lines 25-28 and col. 3, lines 42-46).

With respect to claim 19, Brown teaches the computer-readable medium as discussed in claim 14.

Brown teaches a method for searching a longest prefix match of a key or pattern in the search tree, the key or prefix match key is the control blocks for searching pattern in the search tree and including a plurality of address location and nodes or leaves as shown in the fig. 2B. Brown does not clearly teach wherein a format for a pattern

Art Unit: 2162

search control block includes at least one of a search control block; a next pattern address that point to a next pattern search control block; a leaf control block address that points to a leaf or result; and a next bit or bits to test.

However, Angle teaches a table containing the starting address location for a search tree (fig. 3, and col. 1, lines 50-58 and col. 2, lines 8-36) and next address field (col. 6, lines 63-67 and col. 7, lines 1-42).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Brown with the teachings of Angle. One having ordinary skill in the art would have found it motivated to utilize the use of a table containing the starting address for a search tree and the next address as disclosed (Angle's col. 1, lines 50-58 and col. 2, lines 8-36, col. 6, lines 63-67 and col. 7, lines 1-42), into the system of Brown for the purpose of reducing the amount of memory required to store the data and perform the search in a more faster and efficient manner (Angle's col. 1, lines 25-28 and col. 3, lines 42-46).

With respect to claim 20, Brown teaches wherein a leaf data structure includes at least one of a leaf chaining pointer; a prefix length; a pattern to be compared to the search key; and variable user data (sections 0007, and 0066-0067).

With respect to claim 21, Brown teaches the computer-readable medium as discussed in claim 14.

Brown teaches a method for searching a longest prefix match of a key or pattern in the search tree, the key or prefix match key is the control blocks for searching pattern in the search tree and including a plurality of address location and nodes or leaves as

Art Unit: 2162

shown in the fig. 2B. Brown does not clearly teach wherein the direct leaf is stored directly in a direct table entry and includes a search control block and a pattern to be compared to a search key.

However, Angle teaches a table containing the starting address location for a search tree (fig. 3, and col. 1, lines 50-58 and col. 2, lines 8-36).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Brown with the teachings of Angle. One having ordinary skill in the art would have found it motivated to utilize the use of a table containing the starting address for a search tree and the next address as disclosed (Angle's col. 1, lines 50-58 and col. 2, lines 8-36, col. 6, lines 63-67 and col. 7, lines 1-42), into the system of Brown for the purpose of reducing the amount of memory required to store the data and perform the search in a more faster and efficient manner (Angle's col. 1, lines 25-28 and col. 3, lines 42-46).


With respect to claim 22, Brown teaches wherein a pattern search control block is inserted in the search tree at a position where the leaf patterns differ (sections 0062 and 0078-0080).

With respect to claim 23, Brown teaches wherein a pattern search control block has a shape defined by a width of one and a height of one and is stored in a memory that has a line length of at least 36 bits (a key with 40 bits including VPN and IP-address, fig. 3, section 0063).

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh Ly whose telephone number is (571) 272-4039 or via E-Mail: ANH.LY@USPTO.GOV or fax to **(571) 273-4039**. The examiner can normally be reached on TUESDAY – THURSDAY from 8:30 AM – 3:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene, can be reached on (571) 272-4107 or **Primary Examiner Jean Corrielus (571) 272-4032**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). Any response to this action should be mailed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, or faxed to: Central Fax Center **(571) 273-8300**

ANH LY 
OCT. 12th, 2005


JEAN M. CORRIELUS
PRIMARY EXAMINER